Primary breast lymphoma: A diagnosis not to be missed

IHS Kumarasinghe[1], RP Perera[2]

[1]*Faculty of Medicine, General Sir John Kotelawala Defence University, Ratmalana, Sri Lanka.*
[2]*University Hospital, General Sir John Kotelawala Defence University, Ratmalana, Sri Lanka.*

Correspondence: Dr. Iranthi Kumarasinghe
e-mail*: iranthiihs@yahoo.com*
https://orcid.org/0000-0001-8530-4545
Submitted on 26.04.2025 and accepted for publication on 10.06.2025

Introduction

Primary breast lymphoma (PBL) is a rare, extra nodal form of non-Hodgkin lymphoma that occurs in the breast, without a prior or concurrent lymphoma in any other part of the body (1-3). They account for less than 0.5% of all malignant neoplasms of the breast (1, 3).

The treatment of PBL is significantly different from that of breast carcinoma (BC) which is of epithelial origin. Therefore, it is important that there are awareness and vigilance regarding this entity to prevent misdiagnosis and mismanagement.

Case presentation

A 48-year-old female presented with a painless lump in the right breast of two months duration. She had neither other comorbidities nor a family history of breast cancer. Clinical examination revealed a firm lump in the upper outer quadrant of the right breast. The axillary lymph nodes were not palpable. Mammography revealed an irregular, hypoechoic mass with internal vascularity, at 10 o'clock position with no enlarged lymph nodes. Subsequently, a guided core biopsy of the breast lump was done.

Microscopy showed a diffuse infiltrate of cells with enlarged, round, vesicular nuclei, prominent nucleoli and moderate amounts of cytoplasm. Mitoses were increased. ER (oestrogen receptor), PR (progesterone receptor) and HER2 (human epidermal growth factor 2 receptors) were negative.

The Ki 67, which is a marker of cell proliferation, was 70%, indicating high proliferative activity of the tumour. Immunohistochemistry (IHC) for AE1/AE3 (antibodies used to identify epithelial cells and hence carcinomas) was negative. LCA (leucocyte common antigen, used to identify leucocytes/ lymphocytes) and CD 20 (used to identify B lymphocytes) showed strong positivity of the atypical cells. CD3 (used to identify T lymphocytes) was negative.

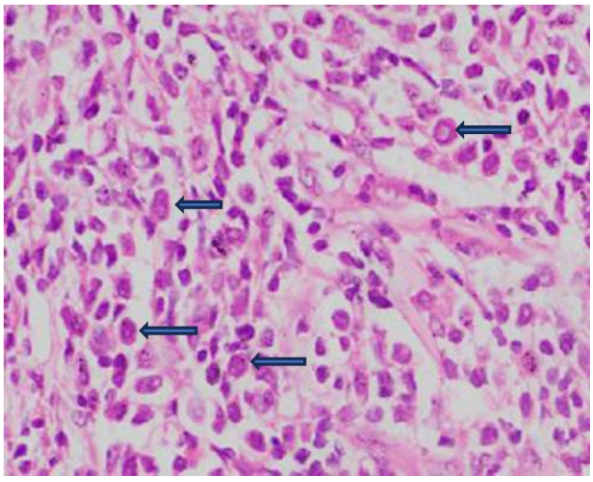

Figure 1: H&E (X 2000.) Tumour comprising a diffuse infiltrate of cells. Some of the atypical cells are denoted by arrows

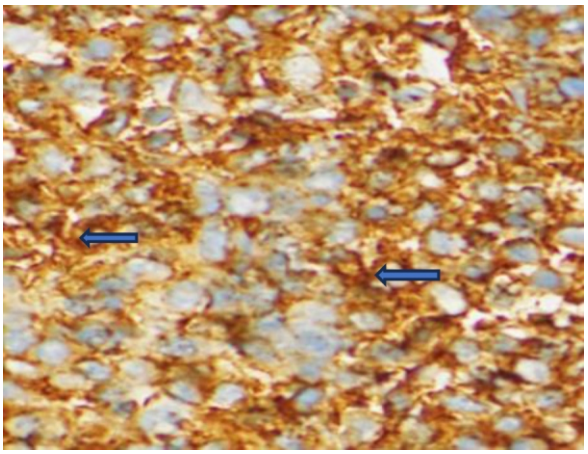

Figure 2: IH for CD20 (X 400). CD 20 showing positive membranous staining (indicated with arrows)

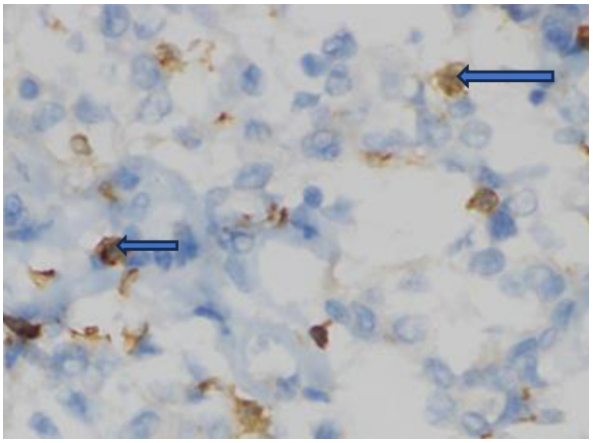

Figure 3: IHC for CD3 (X 400) showing scattered, positive cells (indicated with arrows)

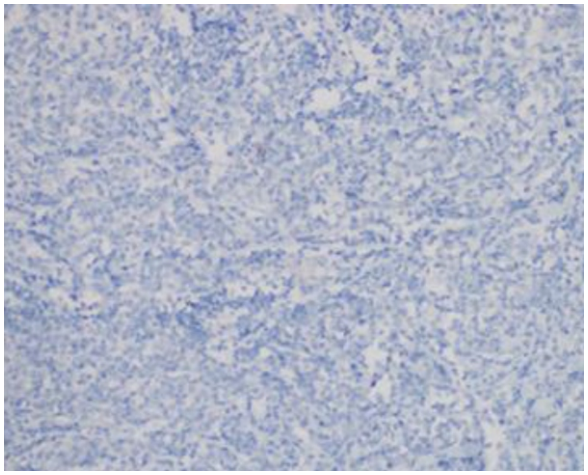

Figure 4: IHC for AE1/AE3 (X 400) is negative. Positive staining would have been indicated by brownish staining of the cytoplasm. As there is no brownish staining, AE1/AE3 is negative

The above features were in keeping with a B cell lymphoma of the breast. The patient was subsequently referred to the oncology clinic. She was in her third cycle of chemotherapy with cyclophosphamide, doxorubicin hydrochloride (hydroxydaunorubicin), vincristine sulfate (Oncovin) and prednisone (CHOP) and has three more cycles were yet to complete by the time of this case report was written.

Discussion

Primary breast lymphomas are thought to arise from the mucosa associated lymphoid tissue (MALT), adjacent to the lactiferous ducts and acini and from intramammary lymph nodes (2). Most primary lymphomas of the breast are of the Non-Hodgkin B cell type (1). Of these, the majority are diffuse large B cell lymphomas (2). The ipsilateral axillary lymph nodes may or may not be involved by the disease (2).

PBL mainly occurs in females (1). However, cases have been reported in men (1). PBL is mainly seen in the 7th decade of life (1). Its clinical features are not much different from those of BC (3). PBLs are known to present with a rapidly enlarging mass (3). Our patient, complained of a breast lump observed for two months' duration which is in keeping with this observation. The radiological findings of PBL are similar to those of BC (3, 4). Therefore, radiology is of limited value in its differentiation.

As such, adequate tissue sampling is required for accurate diagnosis (4). Therefore, diagnosing lymphoma on the limited tissue available on a core needle biopsy may be difficult. The core needle biopsy of this patient was initially reported as invasive breast carcinoma (NST), Nottingham grade 3. Nottingham grade 3 tumours are high grade neoplasms showing diffusely infiltrating cells with no acinar formation, increased mitoses and nuclear pleomorphism (5). These features are also compatible with those of a lymphoma on H&E (4).

ER, PR, and HER2 being negative were in keeping with a triple negative breast cancer. The Ki 67 value being high was also supportive of this diagnosis.

However, review of the H&E slide a second time raised the suspicion of a lymphoma which would also show the same IHC profile. Therefore, to exclude this possibility, IHC for AE1/AE3 and LCA were done. Ae1/ AE3 being negative excluded a triple negative breast carcinoma while LCA being positive confirmed that this tumour was a lymphoma. CD 20 positively identified the atypical cells as being of B cell origin.

Bcs are treated with chemotherapy with or without mastectomy. The chemotherapeutic regime depends on the ER, PR, and HER2 status. PBLs are managed with chemotherapy and radiotherapy as mastectomy has shown higher mortality and poorer prognosis (1,3,4). Furthermore, the chemotherapy regimes used for PBL differ from that of BC (4). Therefore, misdiagnosis will subject the patient to unnecessary surgery or the wrong chemotherapy regime.

Conclusions

Diagnosis of PBL on a core needle biopsy may be difficult due to the limited amount of tissue available. Therefore, awareness and extra vigilance is needed when reporting triple negative breast biopsies, especially those of a high Nottingham grade.

Written informed consent has been obtained from the patient to publish this case report.

References

1. Sakhri S, Aloui M, Bouhani M, Bouaziz H, Kamoun S, Slimene M, Ben Dhieb T. Primary breast lymphoma: a case series and review of the literature. *J Med Case Rep.* 2023; **17**: 290. DOI: 10.1186/s13256-023-03998-8.
2. Moura C, Maria Inês Leite M, Parreira R, Medeiros A. Primary breast lymphoma. *Journal of Surgical Case Reports.* 2020; **22**(20) DOI: 10.1093/jscr/rjz40520).
3. Guo M, Liu J, Gilmore R, *et al.* Primary breast diffuse large B cell lymphoma. BMJ Case Rep. 2022; **15**: e250478. DOI: 10.1136/bcr-2022-250478.
4. Uenaka N, Yamamoto S, Sato S, Kudo T, Adachi S, Narui K, *et al.* Primary breast lymphoma initially diagnosed as invasive ductal carcinoma: A case report. *Clinical Case Reports.* 2021; **9**(6): e04189. DOI: 10.1002/ccr3.4189.
5. van Dooijeweert C, van Diest PJ, Ellis IO. Grading of invasive breast carcinoma: the way forward. *Virchows Archiv.* 2021; **480**(1): 33-43.